

EDITORIAL

Development of Bioprocesses for Potential Functional Ingredients from Marine products

We are delighted to present a special issue on the subject of bioactive compounds from marine organisms with various beneficial biological activities that promote good health. We present here six articles on various aspects of the subject.

Some digestive lipolytic and amylolytic enzymes from marine organisms have been characterized. Many of these enzymes display potentially interesting new biochemical properties for industrial applications. Potential adequacy of amylolytic enzymes for biotechnological applications such as oligosaccharides production was demonstrated. Lipase and phospholipase from marine snail (*Hexaplex trunculus*) showed stability in the presence of organic solvents, as well as at high temperatures, that makes them good candidates for application in non-aqueous catalysis.

Astaxanthin, the main carotenoid found in crustaceans, has been shown to be an effective pigment when incorporated into feeds for salmonidae and crustaceans. Astaxanthin also has other important applications in food industries. This pigment is a potent antioxidant and has a possible role in human health. Astaxanthin was extracted using organic solvents from the waste of shrimp processing (*Parapenaeus longirostris*). It exhibited high inhibition of β -carotene bleaching and also showed a well DNA protection against degradation by hydroxyl radicals. The anti-proliferative activity of the astaxanthin extract was also investigated.

The large production of sulfated polysaccharides was routinely investigated by various procedures such as enzymatic method and acid hydrolysis. The free-radical depolymerization applied directly on the skin of ray constitutes an efficient method and an original process to produce bioactive compounds in large amount and good reproducibility. The depolymerised sulfated polysaccharides fractions obtained from the skin of ray *Raja montagui* have an average molecular weight ranging from 29 kDa to 5 kDa and were endowed with higher anticoagulant activity compared to mammalian dermatan sulfate from intestinal mucosa.

Enzymatic hydrolysis of proteins from marine resources could be produced for uses like functional ingredients in a wide and always increasing zone of application in different food products. Control of the degree of hydrolysis is carried to improve nutritional properties and texture of foods, to increase or decrease the protein solubility, to achieve better

emulsifying and foaming properties, to reduce or eliminate disagreeable off-flavours and odours, to remove toxic ingredients or anti-nutritional factors and/or to contribute to texture build-up in manufactured foods. Two microbial enzymes (Alcalase® 2.4 L and *Bacillus licheniformis* NH1 proteases) were used for preparation of cuttlefish muscle protein hydrolysates (CMPHs) with different degree of hydrolysis. The impact of cuttlefish protein hydrolysis on surface and interfacial properties and the relationship between them was studied.

Some relevant bioactive activities ascribed to collagen- or gelatin peptides from marine sources were described. Thus, antioxidative, antihypertensive (ACE inhibitory), antimicrobial, opioid, joint-regenerative, calciotropic and secretagogue activities of collagen and gelatin hydrolysates are reviewed, as well as other interesting bioactive activities.

Thus, the special issue covers a wide range of systems and describes the importance of marine organisms as a source of novel bioactive substances. These substances include proteins and biopeptides, carotenoids and carotenoproteins, enzymes, collagen and glucosamine. Such bioactive molecules may serve as important value-added nutraceuticals, natural health products and functional food ingredients that can be used for health promotion and disease risk reduction.

Ali Bougatef
(Guest Editor)

Institut Supérieur de Biotechnologie de Sfax
BP 1175, 3038, Sfax Tunisie
Tel: +216 74 674 354
Fax: +216 74 674 364
E-mail: ali.bougatef79@gmail.com

Rafik Balti

(Co-Guest Editor)

Institut Supérieur de Biologie Appliquée
Médénine 4119, Tunisie_
Tel: +216 75 63 39 19
Fax: +216 75 63 39 18
E-mail: rafikbalti1981@gmail.com

Oscar Martinez-Alvarez

(Co-Guest Editor)

Institute of Food Science, Technology
and
Nutrition (ICTAN-CSIC)
Ciudad Universitaria
28040 Madrid Spain
Tel: +34915492300
Fax: +34915493627
E-mail: oscar.martinez@ictan.csic.es